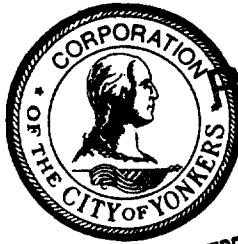


TERENCE M. ZALESKI
MAYOR

ROBERT K. OLSON
COMMISSIONER



POLICE DEPARTMENT
CITY OF YONKERS

RECEIVED
FEB - 8 1993
FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

ROBERT W. CACACE
JUSTICE CENTER
104 SOUTH BROADWAY
YONKERS, NY 10701-4007
914-377-7200

RECEIVED

February 1, 1993
FEB 8 1993

Ms. Donna R. Searcy
Secretary of the Federal Communications Commission
1919 M Street, N.W. -- Room 222
Washington, DC 20554
FCC - MAIL ROOM.

Re: PR Docket 92-235

Dear Ms. Searcy:

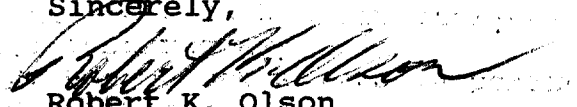
The City of Yonkers Police Department is issuing a request for proposals for a completely new radio system this month. Our present system is fourteen years old, obsolete and unmaintainable. We are extremely concerned about the actions the FCC is proposing to take as described in the Notice of Proposed Rule Change. Our concerns center on:

- the temporary monopoly which will be given to Motorola and its potential for having our system cost more money than if a competitive market existed;
- the very short time for the new system's life -- having to be replaced by 1/1/2004; combined with
- the unavailability of any FM technology which provides adequate intelligibility for police work at 6.25 KHz channel spacing; and
- the net loss in throughput from the use of one of our channels for digital data -- an investment made, in part, to make our use of spectrum more efficient.

The attached letter describes these objections in more detail.

As a result of these problems with the proposed rule change, the City of Yonkers Police Department opposes acceptance of the rule changes as now written. While we understand the need for "refarming the spectrum," and support the objectives of the NPRC, until the issues discussed above are resolved in a way which would not have strong negative cost and intelligibility impacts on our police communications system, we must voice our exceptions about these proposed changes.

Sincerely,

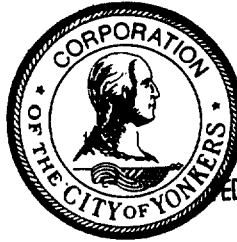

Robert K. Olson
Commissioner of Police

Att: Letter from M.L. to FCC

No. of Copies
List ABC
OHL

TERENCE M. ZALESKI
MAYOR

ROBERT K. OLSON
COMMISSIONER



RECEIVED

FEB - 8 1993

ROBERT W. CACACE
JUSTICE CENTER
104 SOUTH BROADWAY
YONKERS, NY 10701-4007
914-377-7200
FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

POLICE DEPARTMENT
CITY OF YONKERS

INFORMATION AND COMMUNICATIONS SYSTEMS

RECEIVED

FEB 8 1993

February 1, 1993 MAIL ROOM

Ms. Donna R. Searcy
Secretary of the Federal Communications Commission
1919 M Street, N.W. -- Room 222
Washington, DC 20554

Re: PR Docket 92-235

Dear Ms. Searcy:

The City of Yonkers has delayed acquisition of our new UHF police radio system so as to be able to use newly available digital radio technology. At the same time we are interested in supporting the Project 25 goals with a view towards using more spectrally efficient equipment in the future, when there were open standards and competitive procurements. We didn't want to make a very large investment in existing technology only to find that we had to make another change before we got our money's worth from the equipment. We were thus looking at Motorola's 12.5 KHz Astro and Ericsson GE's 25 KHz Aegis equipment.

Having seen the recently published docket, we are very concerned about the time frame for the second phase of spectrum efficiency measures, as well as the date for the initial halving of channel bandwidths. We must make a commitment to a vendor now since our present equipment is fourteen years old, low functioning, obsolete and largely irreparable; our planned new system will be implemented during 1993. Based on our reading of the Notice of Proposed Rule Change (NPRC) it would appear that there is only one vendor from whom we can buy our system, Motorola, because of the 12.5 KHz spacing requirement for Jan 1996. But even they do not presently offer a system using the APCO 25-approved vocoder technology. The FCC appears to have given Motorola temporary monopoly power over the public safety marketplace. We fear it will cost the taxpayers dearly! At the same time we do not feel we could face the taxpayers if we purchased a system which we knew at the time of purchase would have to be replaced in 2004, because of the economic difficulties faced by the city. That is what the FCC's proposed timetable would do. Yonkers is not unique in this situation. A fifteen year life cycle for the new system is our goal. Consequently we are distressed, to put it mildly, when we read in the FCC's NPRC that

we (being in "Market 1") would have to go to quarter bandwidth channels by Jan. 1, 2004. We are not aware of any FM equipment which can be purchased that will even be field upgradable to operate in 6.25 KHz bandwidth. Will the FCC pay for the 2004 system upgrade?

We have questions whether any vendor can supply FM equipment with signal to noise ratio or intelligibility appropriate for public safety applications which will comply with the proposed 6.25 KHz channel spacing, 5 KHz bandwidth. Public safety radio has utilized frequency modulation technology because there are a large number of benefits compared to amplitude modulation. Today all police radio is FM. If I understand the spectral effects of FM transmission correctly, with a maximum frequency deviation of 2.5 KHz (5 KHz bandwidth in 6.25 KHz channel spacing) for the audio range of 300 to 3000 Hz, the deviation ratio (maximum frequency deviation, f_d , divided by modulating frequency, f_m), would range between 8.33 and 0.833. (This is the analog voice case.) For low audio frequencies (dev. ratio 8.33) much of the spectral energy would be contained in the channel's 5 KHz bandwidth; this is definitely not the case for higher frequencies. Here, no sidebands for $f_m = 3000$ are found within the frequency interval $(f_c - f_d, f_c + f_d)$, where f_c represents the carrier frequency. I.e., the audio cutoff would be below f_d . Even with pre-emphasis, to boost the deviation for highs, it appears that the narrow bandwidth will truncate much of the high audio frequencies. In addition, with reduced deviation, the dynamic range of the audio and perhaps even the amount of total audio power will be reduced, degrading signal to noise ratio (SNR). These degradations, both in audio spectrum and SNR would reduce intelligibility. To obtain such narrow band capability would require some kind of single sideband AM, such as Amplitude Companded Single Side Band. However, using ACSB requires a complete changeover of all equipment, as it is not FM radio. I am not aware of any widespread use of ACSB in public safety mobile radio systems and would want to learn about successful installations before committing my city to its use.

Another problem we foresee is coverage problems. Along with the truncated bandwidth requirement in the proposed rule change, there is also a requirement for reduction in antenna height/output power. To obtain the same signal to noise ratio at a subscriber unit will require more not less received power. For our terrain this may translate to additional simulcast sites, increasing the complexity and cost of our base units. Conversely, with subscriber units also transmitting at truncated spectral power, we will need more satellite receivers. Thus we will be paying even more for much less capability -- not a good trade off.

For the sampled data case, which is very much a function of the vocoding scheme, it would seem that intelligibility would also be much worse, since today's digital voice systems, operating with at least 12.5 KHz channel spacing are just adequate, not very good. Shannon's sampling criterion states that sampling must occur at a

minimum rate of twice the highest frequency contained in the (audio) signal. To transmit intelligible digitized voice, together with error correction codes, synchronization and other necessary signaling in such a narrow bandwidth implies severe band limiting of the audio portion, which will result in "robot speech," -- which may be quite unsuitable for police work in what are often noisy environments (ambient noise, not RF noise). (I know there are important benefits to digitized voice systems, such as the reduction of noise through the use of ECC technology, but there are trade-offs and intelligibility degradation, except at low SINAD, is one.) Public safety applications would suffer with degraded intelligibility.

In addition, we are converting one of our present voice channels to a data channel for fire and police. One reason for this is to unload our presently ultrabusy voice channels by moving as much traffic to mobile data terminals and computers as possible. We expect to obtain a bit rate of at least 9600 bps on our present 25 KHz channel. If we have to go to 6.25 KHz spaced channels, the mobile data network's bit rate will drop precipitously since field units would either have to be assigned to a specific channel thus only be able to operate well below 4800 bps or would have to "listen" to two < 4800 bps channels to find idle time to send a packet. Where a message transmission would be directed to several units the new system might have to send them twice if the recipients were on different channels -- adding to the overall traffic. This traffic multiplier effect also applies to messages which must be sent to all units. Since messages of the same bit length will take at least twice as long to be transmitted using half or slower bit rate channels, average service times will more than double. However, message "arrivals" will not be halved, because of the need for both channel transmissions. Consequently the channel utilization factor will be higher than for a single channel, resulting in longer queuing times than for a single higher speed data channel. Hence this situation is not equivalent to one faster channel! In addition, we would have to double our investment in the radio portion (fixed and mobile) and the computer control portion would also have to be changed -- to operate on two channels. Will the FCC grant us a third channel to help us regain the 9600 bps we now expect to have? Will they pay for two additional channels worth of equipment -- both base station and mobile? Would we even be licensed for the additional channels?

Para. 25 states that "it appears that the reduction in transmitter deviation can be accomplished without great expense through a combination of manual adjustment of existing equipment and software". This assertion needs to be challenged. We asked our present vendor, Motorola, how this might be accomplished and they said they were unaware of how this might be done with any available equipment, certainly not with the equipment we own; going to 12.5 KHz spacing requires new base and subscriber equipment. While it wouldn't be so expensive to replace base station transmitters, the real cost is in all the subscriber equipment -- there are so many units, each with transmitters. In addition, receiver RF portions

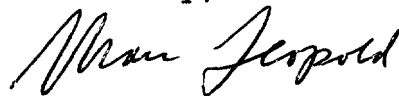
are not designed for the narrower bandwidths and would require replacement. The bottom line is that to accommodate the half width channels, all of our transmitters, receivers and subscriber units would have to be replaced. Worse, however, is having to go out and replace all this equipment eight years later.

Appendix A of the Notice includes a paragraph referring to "Grand-fathered Maximum Power/Antenna Heights and Bandwidths." This para. turns the common understanding of grandfathering on its head! This just pushes ahead the time when new equipment must meet the new rules.

The Notice appears to address the issue of giving Motorola a temporary monopoly in paragraph 9 on page 4, where it states "This proposed plan would permit this option." referring to EGE's 25 KHz spacing TDMA approach. However, a reasonably close reading of the Notice failed to provide to this reader how this would take place, and more importantly, how TDMA would be interoperable with FDMA. Para. 22 on page 9 did not clarify this issue.

As a result of these problems with the proposed rule change, the City of Yonkers Department opposes acceptance of the rule changes as now written. While we understand the need for "refarming the spectrum," and support the objectives of the NPRC, until the issues discussed above are resolved in a way which would not have strong negative cost and intelligibility impacts on our police communications system, we must voice our opposition to these ill-conceived proposed changes.

Sincerely,



Marc Leopold
Director

cc: Police Commissioner
John Powell, Pres., APCO
Vincent Stile, Member, APCO Project 25 Committee

\projmgt\rule88.fcc